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A cloth bag, a cloth for manufacturing the said bag and a  
method for manufacturing the said cloth

The present invention relates to a cloth bag, a cloth for manufacturing the said bag and a method for manufacturing the said cloth.

For the transportation and storage of goods in bulk, use is made of bags of woven cloth, notably made from synthetic material such as polypropylene or polyethylene in particular. Some of these, referred to as big bags in the circles concerned, are used for the transportation, handling and storage of the most diverse goods, but other smaller bags with the shape of a well-filled rectangular pillow are also used for smaller quantities. The methods for manufacturing the large and small bags are very similar and the manufacturers are mainly the same. All these bags are well known particularly in port, railway and road places.

The above information is given in order to give an idea and to determine overall what type of bags will be dealt with below. There is no limitative intention, with regard to the size, shape or particularities of such a bag, it is simply a case of a complete, very polymorphous category.

Depending on the nature of the product or goods to be transported, smaller or larger bags are used. In this case, it is historically with relatively small bags that the initial problem is posed. This is because, in order to package and transport sugar for example, use is made of 50 kilo bags, which are therefore relatively small, whose shape is very usual (bags of sand, cement, rice, etc.) and recalls the shape of a well-filled rectangular pillow. According to current technology, and particularly its most modern development, these bags are transported not in bulk but carefully stacked on pallets. At the present time, the filling of the bags, their closure, their movement by conveyer belts and then their

arrangement on pallets, have a tendency to be completely automated. The result is that any mishandling, slippage, etc. leads to the temporary paralysis of the entire line. Since on a pallet up to twenty 50 kilo bags are arranged, it will be realised that, if one of them slips, it draws other bags with it and ruins productivity. Automatic palletisation is not strictly the cause of the need, but it has been revealing of it.

In order to make the bags in question, use was made in the past of coarse jute canvas, which slipped little. However, for various reasons, some of which were clearly economical, the bags in question are at the present time produced from synthetic material and slide much more than jute bags did.

Briefly, it has become highly advantageous to be able to propose a bag which reconciles the advantages of modern technology, that is to say produced from synthetic material, and those of the earlier technology, that is to say which can offer a certain guarantee of stability if stacked.

In the field of bags there is known, for example from the document FR 2 259 926, a technique consisting in using threads of different qualities, the thread from one or more shuttles being chosen for its greater roughness.

There are also known, in fields other than that of bags, applications in which the tension of certain threads in a weave is acted on, by reducing it, either to form anchoring loops (DE 40 24 622 C) or to provide the cloth of a sail with a kind of maximum tension stop (DE 86 13 729).

The aim of the present invention is to propose a bag made from synthetic material whose texture means that it is possible to stack it better than normal bags made from synthetic materials, but without involving threads of different qualities.

To this end, the invention relates to a method for manufacturing, on a circular or flat weaving loom, a cloth with warp threads and weft threads, characterised in that in the weft at least one ribbon thread is used and in that there is applied to it a weaving tension less than that of the other weft threads, ribbons or not, a lesser tension chosen so that the said ribbon thread forms, on the surface of the cloth, projecting loops having at least one sharp edge, so that the coefficient of friction of the cloth is increased thereby, in particular the cloth/cloth coefficient.

The invention also relates to a cloth suitable for the manufacture of bags and having warp threads and weft threads, characterised in that at least one of the weft threads is a ribbon thread and in that the said ribbon thread forms, on the surface of the cloth, projecting loops having at least one sharp edge, so that the coefficient of friction of the thread is increased thereby, in particular the cloth/cloth coefficient.

The invention also relates to a bag for transporting and storing goods in bulk, characterised in that it is produced, at least partly, by means of said cloth.

The following description, given by way of example, refers to the drawing, in which:

Figure 1 shows a piece of cloth according to the invention and illustrates the irregularity, intentional and ordered, caused by the application of the method according to the invention.

Figure 2 illustrates a detail of the piece of cloth depicted in Figure 1.

Figure 3 illustrates a detail of a thread of the cloth depicted in Figures 1 and 2.

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The key, that is to say the heart of the invention, lies in the manner of making the cloth. For the type of cloth used for manufacturing bags of the type concerned, it is possible to use both flat weaving looms and circular looms. The method according to the invention applies equally well to both.

The method consists in intentionally misadjusting the weaving loom, that is to say using it according to parameters where it is known pertinently that they are not optimal, in theory at least. In concrete terms, the theoretically ideal tension of at least one weft shuttle is reduced so as to cause

in the weave, which is otherwise tensioned and even, at least one slightly loosened thread which profits from its relative freedom in order to create, on the two faces of the cloth, kinds of regular meanders of low magnitude and relatively close together despite everything.

In Figure 2, which illustrates the preferential variant of the cloth and of the bag according to the invention, there can be seen a woven cloth 1 with a thread which is in the form of a fine ribbon or tape, consequently the weave constitutes a kind of draughtsboard. It should be noted that the loops formed by the woven thread are slightly loosened. Such threads result from films which are extruded and cut into fine tapes by means of knives. Once the tape has been cut, the thread is wound in order then to be used on a loom.

In Figure 3, it can be seen that, because of the fact that the thread is in the form of a fine tape, each loop 2 has a fairly sharp edge 3, which acts as a scraper, which considerably increases resistance to slip.

In this way, the prime function of the bag, that is to say holding its contents, is not altered, since the loosened thread does not result in forming holes through which the merchandise could escape.

It is of course unnecessary to give here the tension values since they are peculiar to each loom, but anyone could obtain the required result by means of a few tests and thus choose the reduction in tension which best suits his tool.

As depicted in Figure 1, the cloth 1 produced according to the method which has just been described has the particularity of an overall regular weave including nevertheless an abnormality (or several if the tension of several shuttles is reduced) which consists in the repetition, at regular intervals, of a succession of protuberances 2 which

correspond to the thread or threads which meander more freely and with more magnitude than the others.

As a result the cloth has a coefficient of friction greater than a traditional cloth made with the same supplies and on the same loom.

The final beneficiary of this greater coefficient of friction is obviously the bag made with the cloth according to the invention since its resistance to slip is increased in a spectacular manner.

An empirical experiment was conducted in order to attempt to discern, rather than strictly measure, the advantage of the invention. This experiment took place as follows. On a board placed horizontally the first step was to fix, pressed against the board, a piece of cloth according to the invention, nailing it at its edges. A 50 kilo bag duly filled was then deposited, completely produced with the cloth according to the invention. Then one of the ends of the board was raised as far as the inclination at which the bag slipped and came adrift. The operation was then repeated by disposing the bag according to various orientations. Then the same experiment was carried out by nailing a traditional cloth and using a bag manufactured also from a traditional cloth.

Although this is a case neither of scientific values nor of absolute values, it should however be noted that, for a board two metres long, the traditional bag slipped on average as from an elevation of 67 centimetres of one of the ends of the board. The same experiment with the cloth according to the invention, as has just been described, indicated that on average the bag began to slip as from an elevation of 136 centimetres. In other words, and without claiming scientific exactitude, it can be seen even so that the gain is from single to double.

It should be emphasised here that it is not the properties of the bag and cloth in absolute terms which are decisive, that is to say the expression of these properties vis-à-vis the environment whatever it may be. On the contrary, it is indeed the effect of cooperation between them of two bags according to the invention which is sought and obtained.

This constitutes a remarkable advantage of the invention, particularly if it is noted that this advantage is obtained at zero cost, which is rarely enough the case to be recorded.

Certainly, a little more thread is consumed, but this is insignificant. On the other hand, in order to apply the method, it is necessary to recourse neither to additional instruments or tools, nor to thread of a different quality from that used on the other shuttles. The properties of the thread, with the exception solely of the tension applied, remain constant, and a perfect homogeneity of the properties of the cloth is guaranteed. Finally, as merely and solely the tension is acted on, the change from a setting according to the invention to a traditional setting, and vice-versa, is very rapid, so that the sequencing of different works does not give rise to unnecessary immobilisation of the loom, which would be the case if at least one thread of a different nature were used.